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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,970	07/25/2006	Atsushi Matsumoto	L9289.06168	5410
52989 7590 11/04/2008 Dickinson Wright PLLC James E. Ledbetter, Esq. International Square 1875 Eye Street, N.W., Suite 1200 Washington, DC 20006				
EXAMINER				
JAMA, ISAAK R				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/586,970

**Applicant(s)**

MATSUMOTO ET AL.

**Examiner**

ISAAK R. JAMA

**Art Unit**

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/309)
- Paper No(s)/Mail Date 07/25/2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 12, 15, 17, 18, 20-22 and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication Number 2004/0233838 (Sudo et al.).
2. Regarding claims 1, 17, 20 and 28-29, Sudo teaches a reception apparatus (Figure 32) comprising: a determination section that makes a determination of a propagation path state through which a received multi-carrier signal is transmitted (Figure 37, #s 123 & 125); a specifying section (Figure 32, # 261, page 12, paragraph 0195; i.e. Size comparison section 261 compares propagation path characteristics A, B, C & D with threshold value 1, and reports the comparison result as decision signal S10 to selection sections 251 and 252 of transmitting system 250 of the OFDM communication apparatus) that specifies a region having a propagation path state that is equal to or better than a predetermined level in a frequency band used for the received multicarrier signal, according to the determination result (Figure 32, page 12, paragraph 0195; i.e. using the calculated propagation characteristics from the

coefficient calculator 127 obtained by the propagation path estimation sections 123, 124 and comparing it to threshold value 1); and a reporting section that reports region information indicating the specified region to a transmission apparatus (Figure 32, item S10, page 12, paragraph 0195).

3. Regarding claim 2, Sudo teaches a reception apparatus wherein: the frequency band used for the received multi-carrier signal is divided into a plurality of frequency bands known to both the transmission apparatus and the reception apparatus (Figure 1, i.e. OFDM sub-carriers); the specifying section (Figure 33, # 261) has a selection section that selects a frequency band having a propagation path state that is equal to or better than a predetermined level among the plurality of frequency bands (Figure 33, page 13, paragraph 0203, Threshold value 1); and the reporting section transmits a report signal via the frequency band selected by the selecting section, and reports the region information to the transmission apparatus (Figure 33, see decision signal S10).

4. Regarding claim 6, Sudo teaches a reception apparatus further comprising, a generation section that generates additional information on the frequency band selected by the selecting section (page 1, paragraph 0010; in order to demodulate the transmit signals TX1 and TX2 from the received signals, it is necessary to estimate the four propagation path characteristics A, B, C, and D. For this purpose, OFDM communication apparatus 1 inserts propagation path estimation preambles in the transmit signals or transmits OFDM signals with specific sub-carriers as pilot carriers), wherein: the selecting section selects a plurality of frequency bands included in the region having the propagation path state that is equal to or better than the

predetermined level (Figure 33, page 13, paragraph 0203, Threshold value 1); the generation section assigns priorities to the plurality of frequency bands selected by the selecting section according to the propagation path state, and includes the priorities in the additional information; and the reporting section reports the additional information in addition to the region information to the transmission apparatus (Page 1, paragraph 0010; on receiving these OFDM signals, OFDM communication apparatus 2 obtains propagation path characteristics based on these propagation path estimation preambles or pilot carriers).

5. Regarding claim 7, Sudo teaches a reception apparatus wherein the reporting section changes the pilot pattern or transmission power of the report signal according to the priorities assigned by the generation section, and reports the additional information to the transmission apparatus (page 8, paragraph 0134; the antenna that transmits pilot carriers is switched alternately. Also, while pilot carriers are being transmitted from one antenna, the other antenna transmits null signals as sub-carriers corresponding thereto).

6. Regarding claim 8, Sudo teaches a reception apparatus wherein after the region information is reported, reception processing of the received multi-carrier signal is performed in the region specified by the specifying section (Figure 33, S10, and block 134; i.e. after the receiver reports the propagation path estimate to the transmitter in the form of signal S10, the received signal is processed in the decoding section 134).

7. Regarding claim 12, Sudo teaches a reception apparatus wherein the determining section performs one of estimation of the propagation path fluctuation of the

received multi-carrier signal and reception quality measurement of the received multi-carrier signal to determine the propagation path state of the received multi-carrier signal (Figure 33, # 261 i.e. Size comparison section 261 compares absolute value  $|AD-BC|$  with threshold value 1, and reports the comparison result as decision signal S10 to selection sections 251 and 252 of transmitting system 250 of the OFDM communication apparatus).

8. Regarding claims 15, 18 and 21, Sudo teaches a transmitting apparatus (Figure 33, # 280) comprising: an acquisition section that acquires from a reception apparatus (Figure 33, Selection elements 251 and 252), frequency band information indicating a frequency band having a propagation path state that is equal to or better than a predetermined level among a plurality of frequency bands (Figure 33, S10); into which a frequency band used for a transmission multi-carrier signal is divided and which are known to both a transmission apparatus and a reception apparatus (Figure 1, i.e. OFDM sub-carriers); and a transmitting section that transmits a signal to the reception apparatus via the frequency band indicated by the frequency band information (Figure 33, # 280).

9. Regarding claim 16, Sudo teaches a transmission apparatus wherein the acquisition section comprises: an identifying section that identifies the frequency band through which a signal is transmitted from the reception apparatus; and a judging section that judges the identified frequency band is the frequency band having the propagation path state that is equal to or better than the predetermined level (Figure 33, # 261 i.e. Size comparison section 261 compares absolute value  $|AD-BC|$  with

threshold value 1, and reports the comparison result as decision signal S10 to selection sections 251 and 252 of transmitting system 250 of the OFDM communication apparatus).

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 2, in view of U.S. Patent Application Publication Number 2005/0063378 (Kadous).

11. Regarding claims 3 and 4, Sudo teaches the limitations of claim 2 above. But Sudo fails to teach that the report signal comprises an ACK signal or a NACK signal used for automatic repeat request control. Kadous discloses an incremental redundancy transmission for multiple parallel channels in a MIMO communication system, wherein the receiver may send back an acknowledgment (ACK) if the packet is decoded correctly or a negative acknowledgment (NAK) if the packet is decoded in error (page 1, paragraph 0008), and that the ACK signal and the NACK signal are distinguished by a difference in pilot patterns or transmission power (Figure 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made

to include the reporting of Kadous in the method of Sudo in order to assure that the correct information is received.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 2, in view of U.S. Patent Number 7,295,517 (Anim-Appiah et al.).

13. Regarding claim 5, Sudo teaches the limitations of claim 2. In addition, Sudo teaches a reception apparatus wherein the reception apparatus sets a transmission signal modulation scheme based on reception quality of the received multicarrier signal (Page 19, paragraph 0287), but Sudo fails to teach that a report signal is modulated by a modulation scheme having a higher transmission rate than the modulation scheme set based on the reception quality. Anim-Appiah teaches that channel quality metrics are used to estimate channel quality and thereby select the appropriate data rates. Most channel quality metrics are related to or estimated from the SNR measured at the receiver in an effort to set the data transmission rates of each channel (Column 2, lines 21-25). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the transmission rate of Anim-Appiah in the method of Sudo in order to comply with the capacity of the communication channel.

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 2, in view of U.S. Patent Number 7,050,395 (Chow et al.).

15. Regarding claim 9, Sudo teaches the limitations of claim 1, above. In addition, Sudo teaches a reception apparatus wherein further comprising: an identifying section that identifies a type of data mapped on the received multicarrier signal (Figure 9A,



page 5, paragraph 0104); But Sudo fails to teach that a control section stops part of the circuit for a predetermined time period when the identified data type corresponds to data that is successively transmitted from the transmission apparatus or data for which a reception error within a predetermined range is allowed. Chow teaches a method and apparatus for disabling an interface between network element data processing units, wherein if the number of ACKs (Acknowledgements) received equals the number of data frames transmitted, physical connection circuitry stops processing (column 10, lines 35-39). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the transmission rate of Chow in the method of Sudo in order to preserve the resources of the communication channel.

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 1, in view of U.S. Patent Application Publication Number 2005/0096089 (Ishii et al.).

17. Regarding claim 10, Sudo teaches the limitations of claim 1, above. But Sudo fails to teach a determining section that determines whether or not the reception apparatus is in a static state; and a control section that stops part of circuit for a predetermined time period when the reception apparatus is determined to be in the static state. Ishii teaches a base station apparatus and a method of allocating resources, wherein a decision section decides whether the communication terminal apparatus is stationary or moving and a resource reservation allocation section allocates reservations of resources according to the respective numbers of moving terminal apparatuses (abstract). Therefore, it would have been obvious to a person of

ordinary skill in the art at the time the invention was made to include the resource allocation method of Ishii in the system of Sudo in order to allocate resources properly according to mobile status.

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 2, in view of U.S. Patent Application Publication Number 2003/0054829 (Moisio).

19. Regarding claim 11, Sudo teaches a reception apparatus wherein further comprising: an acquisition section that acquires the number of communication terminals in a communication system to which the reception apparatus belongs (Figure 33, input signals 1 and 2), But Sudo fails to teach that the reporting section repeats the report signal when the acquired number of communication terminals is equal to or less than a predetermined value. Moisio teaches a channel allocation method in a cellular radio network whereby an uplink priority list is maintained. And wherein the base station utilizes the measurement reports sent by the terminals concerning the interference experienced by the terminals on the connection used. And that several measurement reports are sent repeatedly, for example periodically, during a connection. The measurement report can be based on for example Negative ACKnowledgements (NACK) i.e. the number of data packets intended for the terminal that the terminal is likely to reject on account of transmission errors that occur during data transmission from the base station to the terminal (Figure 3B, page 4, paragraph 0030). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention

was made to include the method of Moisis in the system of Sudo in order to properly allocate bandwidth.

20. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 2, in view of U.S. Patent Application Publication Number 2003/0189917 (Sudo).

21. Regarding claim 13, Sudo teaches a reception apparatus of claim 2, above. But what Sudo (2004/0233838) fails to teach is that a plurality of sub-carrier signals included in the frequency band are assigned to the reception apparatus and other reception apparatuses in advance. Sudo (2003/0189917) teaches a base station apparatus and radio communication method where, a band assigning section refers to the timing signal output from timing generating section, and recognizes the slot configuration in the communication slot. Then, based on the result of detection of received levels in level detecting section, band assigning section assigns an uplink slot and downlink slot configured at predetermined positions in the communication frame to each of terminal stations #1 to #n. (Figure 4, page 2, paragraph 0042). In addition, Sudo (2003/0189917) that the base station performs communication according to an OFDM-CDMA system (page 7, paragraph 0109). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the method of Sudo (2003/0189917) in the system of Sudo (2004/0233838) in order to improve the received quality of the communication signal.

22. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 17, in view of U.S. Patent Application Publication Number 2004/0235485 (Tanaka).

23. Regarding claim 19, Sudo teaches the limitations of claim 17, above. In addition, Sudo teaches a transmission apparatus with a reporting section that performs reporting (Figure 33, #'s 251 & 252; i.e. frequency selection sections that receive a propagation path determination signal S10). But Sudo does not specifically teach that the frequency band assigned to a communication terminal is updated. Tanaka teaches a wireless LAN system and channel allocation method wherein the main frequency of the frequency band used by the wireless communication system is being updated (page 10, claim 16). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the method of Tanaka in the system of Sudo in order to accommodate new users.

24. Claims 14, 22- 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claims 2 and 21, in view of U.S. Patent Number 7,020,110 (Walton et al.).

25. Regarding claim 14, Sudo teaches the claim limitation of claim 2, above. Sudo fails to teach that the report signal is subjected to code division multiplexing. Walton teaches that for a downlink, multiple scheduled terminals may share a particular transmit antenna at the base station, and that such a sharing may be achieved via code division multiplexing; i.e. signals received from mobiles are subjected to a multiplexing scheme, including code division). Therefore, it would have been obvious to a person of

ordinary skill in the art at the time the invention was made to include the resource allocation of Walton in the system of Sudo in order to allow multiple terminals to be multiplexed over the same physical channel.

26. Regarding claims 22, 23 and 25, Sudo teaches the limitations of claim 21 above. In addition, Sudo teaches a base station apparatus wherein the acquisition section acquires a priority of the propagation path state of the frequency band in addition to the frequency band information from each communication terminal (page 26, paragraph 0390). But Sudo does not specifically teach that the transmitting section determines a frequency band to assign to a signal for each communication terminal based on the frequency band information and the priority of the propagation path state of the frequency band. Walton teaches a resource allocation for MIMO-OFDM communication systems where each frequency sub-channel is assigned to a set of high priority terminals (Figure 4, columns 19 & 20, lines 66-67 and 1-30). In addition, Walton teaches that the channel state information (CSI) received from the receivers may be used to achieve high throughput by assigning a proper set of one or more terminals to the available transmission channels such that they are allowed to communicate simultaneously with the base station. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the resource allocation of Walton in the system of Sudo in order to improve the performance of the communication system.

27. Regarding claim 24, Walton further teaches a base station apparatus wherein the transmitting section transmits a report signal via the determined frequency band (Figure

2, steps 214-236). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the resource allocation of Walton in the system of Sudo in order to maximize the performance of the resource allocation process.

28. Regarding claim 27, Walton further teaches a base station apparatus wherein the acquisition section performs the acquiring when updating the frequency band assigned to the communication terminals (Figure 2, steps 216-230). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the resource allocation of Walton in the system of Sudo in order to maximize system performance.

29. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudo above as it applies to claim 22, in view of U.S. Patent Number 7,372,889 (Atarashi et al.).

30. Regarding claim 26, Sudo teaches the limitations of claim 22. But Sudo fails to teach a base station apparatus wherein the transmitting section instructs each communication terminal on the repetition number of the frequency band information in accordance with the number of the accommodated communication terminals. Atarashi teaches a method whereby the base station transmits a signal to the mobile station reporting spreading factor and a number of chip repetitions to be used by the mobile station (Figure 5, S21). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the method of Atarashi in the system of Sudo in order to control the capacity of the communication channel.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ISAAK R. JAMA whose telephone number is (571)270-5887. The examiner can normally be reached on 7:30 - 5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester G. Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/IRJ/

/Lester Kincaid/  
Supervisory Patent Examiner, Art Unit 2617